

Access DB# 67549

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Ann Lam Examiner #: 77568 Date: 5/28/02  
Art Unit: 3763 Phone Number 306-5560 Serial Number: 09/103,072  
Mail Box and Bldg/Room Location: 3D24 Results Format Preferred (circle): PAPER DISK E-MAIL  
CP2

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Moisture transport system for contact electrocoagulation

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

1. Claims 5, 6, 7, 15

607/101,000

expandable electrode array

BEST AVAILABLE COPY

## STAFF USE ONLY

Searcher:	Type of Search	Vendors and cost where applicable
<u>John Sims</u>	NA Sequence (#) <u>STN</u>	<u>STN</u>
Searcher Phone #: <u>308-4836</u>	AA Sequence (#) _____	Dialog <u>✓</u>
Searcher Location: <u>EIC 7700</u>	Structure (#) _____	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr.Link _____
Date Completed: <u>6/7/02</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>60</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>36</u>	Other _____	Other (specify) _____

18/7/1 (Item 1 from file: 350)  
DIALOG(R) File 350:Derwent WPIX  
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014394202 \*\*Image available\*\*

WPI Acc No: 2002-214905/200227

Ablation and/or coagulation apparatus applies radio frequency energy to electrodes that are positioned between fluid conduit and another conformable fluid conduit

Patent Assignee: VIDACARE INC (VIDA-N)

Inventor: BAKER J; EDWARDS S D; LEE K S; STRUL B

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6315776	B1	20011113	US 94265459	A	19940624	200227 B
			US 94338737	A	19940624	
			US 94272162	A	19940707	
			US 94286862	A	19940804	
			US 94319373	A	19941006	
			US 96731372	A	19961011	
			US 97815096	A	19970312	
			US 97857323	A	19970516	
			US 9826316	A	19980219	
			US 99338737	A	19990623	

Priority Applications (No Type Date): US 99338737 A 19990623; US 94265459 A 19940624; US 94338737 A 19940624; US 94272162 A 19940707; US 94286862 A 19940804; US 94319373 A 19941006; US 96731372 A 19961011; US 97815096 A 19970312; US 97857323 A 19970516; US 9826316 A 19980219

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6315776	B1		27	A61B-018/18	CIP of application US 94265459
					CIP of application US 94338737
					CIP of application US 94272162
					CIP of application US 94286862
					CIP of application US 94319373
					CIP of application US 96731372
					CIP of application US 97815096
					CIP of application US 97857323
					CIP of application US 9826316
					CIP of patent US 5505730
					CIP of patent US 5558672
					CIP of patent US 5569241
					CIP of patent US 5575788
					CIP of patent US 5964755
					CIP of patent US 6056744

Abstract (Basic): US 6315776 B1

NOVELTY - An expandable and **moisture** permeable structure (12) which is mounted in an elongated tube, includes several aeration openings. The expandable structure is surrounded by a fluid conduit (26) including openings which in turn is surrounded by a conformable fluid conduit (28). Radio frequency (RF) energy is applied to the **electrodes** (38) mounted between the two conduits.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for **tissue ablation** method.

USE - For **ablating** endometrium layer of uterus and inner layers of other body organs.

ADVANTAGE - The energy is distributed evenly over the target surface. Provides better conformity with surface of endometrium and enhances the delivery of treatment energy to the endometrium.

DESCRIPTION OF DRAWING(S) - The figure shows a cross-sectional view of **ablation** apparatus.

Expandable and **moisture** permeable structure (12)

Fluid conduit (26)

Conformable fluid conduit (28)

**Electrode** (38)

pp; 27 DwgNo 6/13

Derwent Class: P31; S05

International Patent Class (Main): A61B-018/18

18/7/2 (Item 2 from file: 350)  
DIALOG(R) File 350:Derwent WPIX  
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003787692

WPI Acc No: 1983-783920/198341

**Surgical operating instrument using microwaves - has electrode for  
insertion into tissue and held by co-axial cable radiating microwaves**

Patent Assignee: ZENITANI T (ZENI-I)

Inventor: TABUSE K

Number of Countries: 003 Number of Patents: 005

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
DE 3218314	A	19831006	DE 3218314	A	19820514	198341 B
GB 2119253	A	19831116	GB 8213870	A	19820513	198346
US 4494539	A	19850122	US 82374884	A	19820504	198506
GB 2119253	B	19850918				198538
DE 3218314	C	19860424				198618

Priority Applications (No Type Date): JP 8255584 A 19820403; JP 8255583 A  
19820403

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 3218314	A		23		

Abstract (Basic): DE 3218314 A

The surgical operating instrument uses microwaves to effect **coagulation** or hemostasis in living **tissue** or to effect **tissue** separation, e.g. in liver operations. The instrument has a mono-polar operation **electrode** at the end of a co-axial cable which is pref. incorporated in an endoscope to permit observation to be made of the operation conducted with microwaves.

Microwaves are delivered through the co-axial cable to the **electrode** so as to generate thermal energy in the living **tissue** which is being operated. In order to prevent the **electrode** adhering to **tissue**, a cathode current is pref. fed to it at the end of the operation so that **moisture** is generated between **electrode** and **tissue** by electrolysis, so permitting the two to be separated more easily.

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Derwent Class: P31; S05

International Patent Class (Additional): A61B-017/39

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7/5/1

DIALOG(R)File 348:EUROPEAN PATENTS

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01199607

**APPARATUSES AND METHODS FOR INTERSTITIAL TISSUE REMOVAL  
METHODE UND GERT ZUR INTERSTITIELLEN GEWEBEENTFERNUNG  
APPAREILS ET PROCEDES D'ABLATION TISSULAIRE INTERSTITIELLE**

PATENT ASSIGNEE:

Novacept, (2413240), 1047 Elwell Court, Palo Alto, CA 94303, (US),  
(Applicant designated States: all)

INVENTOR:

**SAMPSON, Russel, M.**, 271 Diablo Avenue, Mountain View, CA 94043, (US)  
**HSEI, Paul, K.**, 5047 Capistrano Avenue, San Jose, CA 95129, (US)

**TRUCKAI**, Csaba, 19566 Arden Court, Saratoga, CA 95070, (US)

LEGAL REPRESENTATIVE:

Kazi, Ilya et al (86111), Mathys & Squire, 100 Gray's Inn Road, London  
WC1X 8AL, (GB)

PATENT (CC, No, Kind, Date): EP 1158921 A1 011205 (Basic)  
WO 200047123 000817

APPLICATION (CC, No, Date): EP 2000904491 000121; WO 2000US1562 000121

PRIORITY (CC, No, Date): US 249208 990212

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI;  
LU; MC; NL; PT; SE

INTERNATIONAL PATENT CLASS: A61B-018/18

CITED PATENTS (WO A): US 5415656 A ; US 5810806 A ; US 3850175 A ; US  
5658280 A ; US 3942530 A ; US 5524180 A

NOTE:

No A-document published by EPO

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 001011 A1 International application. (Art. 158(1))

Application: 001011 A1 International application entering European  
phase

Application: 011205 A1 Published application with search report

Examination: 011205 A1 Date of request for examination: 20010912

LANGUAGE (Publication,Procedural,Application): English; English; English

7/5/2

DIALOG(R)File 348:EUROPEAN PATENTS

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01109665

**A RADIO-FREQUENCY GENERATOR FOR AN ABLATION DEVICE  
RADIOFREQUENZ GENERATOR FUR EINE ABLATIONSVORRICHTUNG  
GENERATEUR DE RADIOFREQUENCES POUR DISPOSITIF D'ABLATION**

PATENT ASSIGNEE:

Novacept, (2413240), 1047 Elwell Court, Palo Alto, CA 94303, (US),  
(Applicant designated States: all)

INVENTOR:

**STRUL, Bruno**, 485 Cervantes Road, Portolla Valley, CA 94028, (US)

**TRUCKAI**, Csaba, 627 Alberta Avenue, Sunnyvale, CA 94087, (US)

**SAMPSON, Russel, Mahlon**, 271 Diablo Avenue, Mountain View, CA 94043,  
(US)

**KANE, Mark, Leo**, Unit A 22440 N. Walnut Circle, Cupertino, CA 95014, (US)

LEGAL REPRESENTATIVE:

Jackson, David Spence (32231), REDDIE & GROSE 16, Theobalds Road, London,  
WC1X 8PL, (GB)

PATENT (CC, No, Kind, Date): EP 1076516 A2 010221 (Basic)  
WO 9958070 991118

APPLICATION (CC, No, Date): EP 99922822 990507; WO 99US9904 990507

PRIORITY (CC, No, Date): US 84712 980508; US 306480 990506

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI;  
LU; MC; NL; PT; SE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: A61B-017/00

CITED PATENTS (WO A): GB 2317566 A ; US 4739759 A ; WO 9838932 A ; WO  
9741785 A ; US 5558672 A

NOTE:

• No A-document published by EPO

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 010221 A2 Published application without search report  
Application: 20000112 A1 International application. (Art. 158(1))  
Priority: 010418 A2 Priority information changed: 20010223  
Examination: 010221 A2 Date of request for examination: 20001207  
Application: 20000112 A1 International application entering European  
phase

LANGUAGE (Publication,Procedural,Application): English; English; English

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DIALOG(R) File 350:Derwent WPIX

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013377135 \*\*Image available\*\*

WPI Acc No: 2000-549073/200050

**Interstitial tissue removal method involves inserting shaft and element into unwanted tissue then moving element and shaft to remove tissue**

Patent Assignee: NOVACEPT (NOVA-N)

Inventor: HSEI P K; SAMPSON R M; TRUCKAI C

Number of Countries: 021 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200047123	A1	20000817	WO 2000US1562	A	20000121	200050 B
US 6296639	B1	20011002	US 99249208	A	19990212	200160
EP 1158921	A1	20011205	EP 2000904491	A	20000121	200203
			WO 2000US1562	A	20000121	

Priority Applications (No Type Date): US 99249208 A 19990212

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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WO 200047123	A1	E	37	A61B-018/18	
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Designated States (National): JP

Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

US 6296639	B1			A61B-018/18	
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EP 1158921	A1	E		A61B-018/18	Based on patent WO 200047123
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Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

Abstract (Basic): WO 200047123 A1

NOVELTY - Interstitial tissue removal methods rely on placing an energy conductive element (18) beneath the tissue to vaporize unwanted tissue. The element is then moved in a pattern that removes the desired tissue. Usually the shaft (12) is moved and the element is moved relative to the shaft by pivoting a rigid element or bowing a flexible element.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for a tissue ablation device.

USE - The invention relates to tissue removal instruments for removal of tissue underneath the skin.

ADVANTAGE - The instrument can be used on a wide variety of tissue types and for a wide variety of specific procedures.

DESCRIPTION OF DRAWING(S) - The drawing shows a perspective view of a first apparatus.

Apparatus (10)

Connector cable (26)

Handle (20)

Push/pull wire (21)

Element (18)

Shaft (12)

Aspiration point (24)

pp; 37 DwgNo 1/11

Derwent Class: P31; S05

International Patent Class (Main): A61B-018/18

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DIALOG(R) File 350:Derwent WPIX  
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012851894 \*\*Image available\*\*

WPI Acc No: 2000-023726/200002

**Tissue ablation method for treating chronic bleeding of uterus or gall bladder**

Patent Assignee: NOVACEPT (NOVA-N)

Inventor: KANE M L; SAMPSON R M; STRUL B; TRUCKAI C

Number of Countries: 085 Number of Patents: 005

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9958070	A2	19991118	WO 99US9904	A	19990507	200002 B
AU 9939730	A	19991129	AU 9939730	A	19990507	200018
NO 200005623	A	20010105	WO 99US9904	A	19990507	200109
			NO 20005623	A	20001107	
EP 1076516	A2	20010221	EP 99922822	A	19990507	200111
			WO 99US9904	A	19990507	
CN 1308510	A	20010815	CN 99808369	A	19990507	200174

Priority Applications (No Type Date): US 99306480 A 19990506; US 9884712 P 19980508

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 9958070 A2 E 39 A61B-017/39

Designated States (National): AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW

AU 9939730 A A61B-017/39 Based on patent WO 9958070

NO 200005623 A A61B-018/12

EP 1076516 A2 E A61B-017/00 Based on patent WO 9958070

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

CN 1308510 A A61B-018/08

Abstract (Basic): WO 9958070 A2

NOVELTY - A radio frequency ablation device is positioned in contact with tissue to be ablated. The resistance of the device and the radio frequency impedance of the tissue are measured. A radio frequency power is automatically selected based on the geometry of the tissue. A radio frequency signal at the selected power is then delivered.

DETAILED DESCRIPTION - A fault in ablation device is detected by applying vacuum pressure to the device. The applied vacuum pressure is measured. A fault is judged if the measured pressure falls outside a predetermined range.

INDEPENDENT CLAIMS are also included for a radio frequency generator and for a method for operating a radio frequency generator.

USE - For treating chronic bleeding of the uterus endometrial layer or abnormalities of the gall bladder mucosal layer.

ADVANTAGE - Sufficient power level is selected for the tissue geometry. Over-ablation is prevented by measuring the vacuum level such that if vacuum level exceeds predetermined limits the ablation procedure is terminated.

DESCRIPTION OF DRAWING(S) - The figure shows circuit diagrams of the transformer employed in the tissue ablation method.

pp; 39 DwgNo 6,7/9

Derwent Class: P31; S05; U23

International Patent Class (Main): A61B-017/00; A61B-017/39; A61B-018/08; A61B-018/12

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26/9/1 (Item 1 from file: 2)

DIALOG(R) File 2:INSPEC

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6295035 INSPEC Abstract Number: A1999-16-8760G-001, B1999-08-7520C-035

**Title: Mapping and radiofrequency ablation of ventricular tachycardia**

Author(s): Greenspon, A.J.

Author Affiliation: Jefferson Med. Coll., Philadelphia, PA, USA

Conference Title: Proceedings of the 19th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. 'Magnificent Milestones and Emerging Opportunities in Medical Engineering' (Cat. No.97CH36136) Part vol.6 p.2629 vol.6

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 1997 Country of Publication: USA 6 vol. ix+2819 pp.

ISBN: 0 7803 4262 3 Material Identity Number: XX-1999-00663

U.S. Copyright Clearance Center Code: 0 7803 4262 3/97/\$10.00

Conference Title: Proceedings of the 19th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. 'Magnificent Milestones and Emerging Opportunities in Medical Engineering'

Conference Sponsor: IEEE

Conference Date: 30 Oct.-2 Nov. 1997 Conference Location: Chicago, IL, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Experimental (X)

**Abstract:** Radiofrequency catheter **ablation** has become the nonpharmacologic treatment of choice in patients with a variety of supraventricular arrhythmias. Small discrete lesions are produced by delivering 20-40 W of unmodulated 500 kHz RF energy to the tip of a standard 4 mm electrode catheter. Resistive heating of cardiac **tissue** occurs at the point of **tissue** contact. Successful treatment of these arrhythmias may be achieved in greater than 90% of cases. The results of RF catheter **ablation** for the treatment of ventricular tachycardia (VT) are variable. RF catheter **ablation** in patients with normal hearts who may have either idiopathic left VT arising from right ventricular outflow tract is highly effective with success rates approaching 100%. These tachycardias usually arise from a small focus and therefore the area required for **ablation** is small and easy to target. Unfortunately, most patients who have VT have abnormal ventricular function, frequently a previous myocardial infarction. In these patients, the tachycardia circuits may be large and complex. The efficacy rate of RF **ablation** for VT using current technology is much lower. This presentation will focus on our development of a strategy for successful **ablation** of VT post myocardial infarction (MI). Accurate analysis of the VT substrate is crucial for successful **ablation**. A post-MI model of sustained VT was created in swine by injecting agarose gel beads following PTCA balloon occlusion of the LAD coronary artery. Surviving animals returned for programmed electrical stimulation 4-6 weeks later. Stable sustained VT was induced in 35 animals. This VT could be reproducibly initiated and terminated. A multielectrode "basket" catheter was percutaneously inserted prior to VT induction to map endocardial electrical activation. The "basket" catheter (Constellation, EP Technologies, Sunnyvale, CA) consists of eight self-expanding nitinol struts with 64 symmetrically arranged electrodes. The catheter is capable of both recording and pacing. Using this system we prospectively analyzed the induced VTs in these animals. Bipolar endocardial signals were obtained from the catheter during sinus rhythm and VT. Signals were filtered at 30-500 Hz and recorded multichannel recorder (EP LabSystem, Corp.). Endocardial recordings demonstrated fractionated electrical activity in the zone of infarction during sinus rhythm. Early presystolic activity was recorded during VT as well as middiastolic potentials. Reset of VT was seen in 5 animals. Features of classic entrainment as well as concealed entrainment were demonstrated in 12 animals. These features suggest that the mechanism of VT is endocardial reentry, as in humans. RF **ablation** was performed by guiding a large-tip **ablation** catheter to the appropriate "basket" electrode by means of a "homing device" Successful RF **ablation** of VT was demonstrated in this model. Computer algorithms for analysis of the zone of slow conduction are being developed. Clinical post-myocardial-infarction VT is now mapped and treated in patients using this system. (0 Refs)



Subfile: A B

Descriptors: bioelectric potentials; biological **tissues** ; biomedical electrodes; biothermics; cardiology; radiation therapy; radiofrequency heating

Identifiers: radiofrequency catheter **ablation** ; nonpharmacologic treatment; supraventricular arrhythmias; ventricular tachycardia mapping; small discrete lesions; unmodulated 500 kHz RF energy; standard 4 mm electrode catheter tip; resistive heating; cardiac **tissue** ; **tissue** contact; normal hearts; idiopathic left VT; right ventricular outflow tract ; small focus; abnormal ventricular function; myocardial infarction; tachycardia circuits; efficacy rate; 20 to 40 W; 500 kHz; 4 mm

Class Codes: A8760G (Microwaves and other electromagnetic waves (medical uses)); A8750E (Bio-optics (effects of microwaves, light, laser and other electromagnetic waves)); A8716 (Biothermics); A8770H (Radiation therapy); A8730C (Electrical activity in neurophysiological processes); A8770F (Electrodiagnostics); B7520C (Radiation therapy); B7510D (Bioelectric signals)

Numerical Indexing: power 2.0E+01 to 4.0E+01 W; frequency 5.0E+05 Hz; size 4.0E-03 m

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26/9/2 (Item 2 from file: 2)

DIALOG(R)File 2:INSPEC

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6148393 INSPEC Abstract Number: A1999-05-8770G-006, B1999-03-7520-006

**Title: Efficacy of multiple ring and coil electrode radiofrequency ablation catheters for the creation of long linear lesions in the atria**

Author(s): McRury, I.D.; Haines, D.E.

Author Affiliation: Dept. of Internal Med., Virginia Health Scis. Center, Charlottesville, VA, USA

Journal: Medical Engineering & Physics vol.20, no.8 p.551-7

Publisher: Elsevier,

Publication Date: Nov. 1998 Country of Publication: UK

CODEN: MEPHEO ISSN: 1350-4533

SICI: 1350-4533(199811)20:8L:551:EMRC;1-J

Material Identity Number: B478-1998-009

U.S. Copyright Clearance Center Code: 1350-4533/98/\$19.00

Document Number: S1350-4533(98)00074-5

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

**Abstract:** Atrial fibrillation is an arrhythmia that may potentially be treated by creating long linear lesions in the atria to create lines of electrical conduction block. While this has been performed with success with open-heart surgery, it has been proposed that a less invasive catheter-based approach could achieve similar success. Radiofrequency energy catheter **ablation** was performed in vivo with two novel electrode catheters. Each was an expanding loop design: one with 3 mm ring electrodes; and one with 12.5 mm coil electrodes. Power delivery was controlled automatically with temperature (70 degrees C target) feedback from thermistors embedded in each electrode. A total of 39 lines of **ablation** were created in the atria of 11 normal dogs. The coil electrodes were more effective in creating lesions than the ring electrodes with a similar prevalence of transmuralit (89% vs. 85%) but a higher prevalence of continuous transmuralit (35% vs. 5%). Sequential electrode energy delivery was better than simultaneous multipolar delivery due to varying efficiencies of **tissue** heating. Inadequate heating was observed in 47% of simultaneous versus 1% of sequential multipolar deliveries, and excessive heating in 6% versus 1% of cases, respectively. It is feasible to create linear atrial lesions with an **expanding** loop **electrode** catheter. Catheters with coil electrodes are more effective than those with ring electrodes. In order to avoid coagulum formation and inefficient heating, sequential electrode energy delivery is preferable to multipolar delivery.

(26 Refs)

Subfile: A B

Descriptors: bioelectric phenomena; biomedical electrodes; biothermics; cardiology; patient treatment

Identifiers: coil electrode radiofrequency **ablation** catheters; multiple ring electrode radiofrequency **ablation** catheters; long linear atrial lesions creation; continuous transmural; sequential electrode energy delivery; simultaneous multipolar delivery; **tissue** heating efficiency; inadequate heating; **expanding** loop **electrode** catheter; coagulum formation avoidance; 70 C; 3 mm; 12.5 mm

Class Codes: A8770G (Patient care and treatment); A8728 (Bioelectricity); A8716 (Biothermics); B7520 (Patient care and treatment)

Numerical Indexing: temperature 3.43E+02 K; size 3.0E-03 m; size 1.25E-02 m

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26/9/3 (Item 1 from file: 5)  
DIALOG(R)File 5:Biosis Previews(R)  
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13072717 BIOSIS NO.: 200100279866

Expandable **vein ligator catheter and method of use.**

AUTHOR: Farley Brian E; Henderson Dawn A; Jones Christopher S(a); Parker Mark P; Tartaglia Joseph M

AUTHOR ADDRESS: (a)Sunnyvale, CA\*\*USA

JOURNAL: Official Gazette of the United States Patent and Trademark Office  
Patents 1241 (4):pNo Pagination Dec. 26, 2000

MEDIUM: e-file

PATENT NUMBER: US 6165172 PATENT DATE GRANTED: December 26, 2000 20001226

PATENT ASSIGNEE: VNUS Medical Technologies, Inc. PATENT COUNTRY: USA

ISSN: 0098-1133

DOCUMENT TYPE: Patent

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: A catheter includes a **plurality** of primary leads to deliver energy for ligating a hollow anatomical structure. Each of the primary leads includes an **electrode** located at the working end of the catheter. Separation is maintained between the primary leads such that each primary lead can individually receive power of selected polarity. The primary leads are constructed to **expand** outwardly to place the **electrodes** into apposition with a hollow anatomical structure. High frequency energy can be applied from the leads to create a heating effect in the surrounding **tissue** of the anatomical structure. The diameter of the hollow anatomical structure is reduced by the heating effect, and the **electrodes** of the primary leads are moved closer to one another. Where the hollow anatomical structure is a vein, energy is applied until the diameter of the vein is reduced to the point where the vein is occluded. In one embodiment, a balloon is inflated to occlude the structure before the application of energy. Where the structure is a vein, the inflated balloon obstructs blood flow and facilitates the infusion of saline, medication, or a high-impedance fluid to the vein in order to reduce the occurrence of **coagulation** and to improve the heating of the vein by the catheter. The catheter can include a lumen to accommodate a guide wire or to allow fluid delivery.

MAJOR CONCEPTS: Equipment, Apparatus, Devices and Instrumentation

26/9/4 (Item 2 from file: 5)  
DIALOG(R)File 5:Biosis Previews(R)  
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13030934 BIOSIS NO.: 200100238083

**Methods for reduction of restenosis.**

AUTHOR: Tu Lily Chen; Tu Hosheng

JOURNAL: Official Gazette of the United States Patent and Trademark Office  
Patents 1239 (2):pNo Pagination Oct. 10, 2000

MEDIUM: e-file

PATENT NUMBER: US 6129725 PATENT DATE GRANTED: October 10, 2000 20001010

PATENT COUNTRY: USA

ISSN: 0098-1133  
DOCUMENT TYPE: Patent  
RECORD TYPE: Abstract  
LANGUAGE: English

ABSTRACT: An **ablation** apparatus for treating **tissues**, tubular organs, or atherosclerosis of a blood vessel of a patient having an implanted medical stent, the **ablation** apparatus comprising a catheter shaft having a retracable preshaped **electrode** means at the distal end of the catheter shaft, the **electrode** means having a **plurality** of **expandable** /collapsible wire members adapted for contacting the wire members to the stent and applying RF current to treat the **tissues** underlying the stent for therapeutic purposes.

MAJOR CONCEPTS: Surgery (Medical Sciences); Methods and Techniques  
METHODS & EQUIPMENT: restenosis reduction methods--therapeutic method

26/9/5 (Item 3 from file: 5)  
DIALOG(R)File 5:Biosis Previews(R)  
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13006421 BIOSIS NO.: 200100213570  
**Percutaneous US-guided radiofrequency ablation of hepatocellular carcinomas: Results in 15 patients.**  
AUTHOR: Poggi Guido(a); Gatti Carlo; Cupella Francesco; Fiori Marco; Avanza Francesco; Baldi Maurizia  
AUTHOR ADDRESS: (a)Divisione di Medicina Generale, Fondazione Maugeri, 27100, Pavia: gpoggi@fsm.it\*\*Italy  
JOURNAL: Anticancer Research 21 (1B):p739-742 January-February, 2001  
MEDIUM: print  
ISSN: 0250-7005  
DOCUMENT TYPE: Article  
RECORD TYPE: Abstract  
LANGUAGE: English  
SUMMARY LANGUAGE: English

ABSTRACT: Background: The majority of patients with hepatocellular carcinoma (HCC) cannot undergo surgery because of multifocality, location or advanced cirrhosis. Our experience with percutaneous radiofrequency **ablation** for treatment of patients suffering from unresectable hepatocellular carcinoma is described here. Patients and Methods: Fifteen patients (ten men and five women) with eighteen primary hepatocellular tumors underwent percutaneous radiofrequency **ablation**. The mean diameter of the HCCs was 32 mm (ranging from 15 mm to 62 mm). The patients were treated under ultrasound guidance using either a 18-gauge internally cooled electrode or a 14-gauge **electrode** with four **expandable** hooks. Results: Complete necrosis was achieved in 15 lesions after one session of RF **ablation**. The persistence of a small portion of viable **tissue** was seen in two lesions. One lesion was not evaluable. After a mean follow-up period of 9.2 months (range 3-24 months), eleven patients (76%) showed no sign of local or distant recurrence, one patient developed a new lesion and one of two patients with persistence of viable **tissue** obtained a complete necrosis after the injection of percutaneous ethanol. Moreover, a major complication (intraperitoneal bleeding requiring surgical treatment) and three minor complications (1 pleuric effusion and 2 perihepatic fluid collections that resolved spontaneously) were observed. Conclusion: RF **ablation** is a simple, well-tolerated and effective procedure for the treatment of unresectable hepatocellular carcinomas.

DESCRIPTORS:  
MAJOR CONCEPTS: Gastroenterology (Human Medicine, Medical Sciences); Oncology (Human Medicine, Medical Sciences); Methods and Techniques  
BIOSYSTEMATIC NAMES: Hominidae--Primates, Mammalia, Vertebrata, Chordata, Animalia  
ORGANISMS: human (Hominidae)--aged, aged/80 and over, female, male, middle age, patient

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): Animals; Chordates; Humans;  
Mammals; Primates; Vertebrates  
DISEASES: hepatocellular carcinoma--digestive system disease, neoplastic  
disease  
METHODS & EQUIPMENT: electrode--medical equipment; percutaneous  
US-guided radiofrequency **ablation** {percutaneous ultrasound-guided  
radiofrequency **ablation** }--therapeutic method  
MISCELLANEOUS TERMS: necrosis  
ALTERNATE INDEXING: Carcinoma, Hepatocellular (MeSH)  
CONCEPT CODES:  
24500 Gerontology  
12512 Pathology, General and Miscellaneous-Therapy (1971- )  
14006 Digestive System-Pathology  
24004 Neoplasms and Neoplastic Agents-Pathology; Clinical Aspects;  
Systemic Effects  
24008 Neoplasms and Neoplastic Agents-Therapeutic Agents; Therapy  
BIOSYSTEMATIC CODES:  
86215 Hominidae

26/9/6 (Item 4 from file: 5)  
DIALOG(R)File 5:Biosis Previews(R)  
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12961377 BIOSIS NO.: 200100168526  
**Multiple electrode ablation apparatus and method.**  
AUTHOR: Zepeda John(a); Hirsch Chaya; Lee Kee; Gough Edward J  
AUTHOR ADDRESS: (a)Los Altos, CA\*\*USA  
JOURNAL: Official Gazette of the United States Patent and Trademark Office  
Patents 1236 (3):pNo Pagination July 18, 2000  
MEDIUM: e-file  
PATENT NUMBER: US 6090105 PATENT DATE GRANTED: July 18, 2000 20000718  
PATENT ASSIGNEE: Rita Medical Systems, Inc. PATENT COUNTRY: USA  
ISSN: 0098-1133  
DOCUMENT TYPE: Patent  
RECORD TYPE: Abstract  
LANGUAGE: English

ABSTRACT: An **ablation** apparatus includes an introducer with a distal end  
sufficiently sharp to penetrate **tissue**. An energy delivery device is  
configured to be coupled to an energy source. The energy delivery device  
includes a first **electrode** and a second **electrode** each with a **tissue**  
piercing distal portion. The first and second **electrodes** are at least  
partially positionable in the introducer and deployable from the  
introducer at a selected **tissue** site to an **expanded** state. In the  
**expanded** state the deployed first and second **electrodes** distend  
laterally away from the introducer with a radius of curvature to form a  
shaped **array** of deployed **electrodes** at the **tissue** site when  
positioned at the selected **tissue** site. The first **electrode** distal  
portion and the second **electrode** distal portion are each at least  
partially made of a shaped memory alloy material that displays stress  
induced martensite behavior above body temperature. A cable couples the  
energy source to the energy delivery device.

MAJOR CONCEPTS: Equipment, Apparatus, Devices and Instrumentation;  
Oncology (Human Medicine, Medical Sciences); Surgery (Medical Sciences)  
; Methods and Techniques  
METHODS & EQUIPMENT: ablation apparatus--multiple **electrode**, surgical  
instrument; targeted ablation of tumors--surgical method  
MISCELLANEOUS TERMS: tumors

26/9/7 (Item 5 from file: 5)  
DIALOG(R)File 5:Biosis Previews(R)  
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12657164 BIOSIS NO.: 200000410666  
Ablation **device for treating atherosclerotic tissues**.

AUTHOR: Tu Lily Chen; Tu Hosheng  
JOURNAL: Official Gazette of the United States Patent and Trademark Office  
Patents 1232 (2):pNo pagination Mar. 14, 2000  
MEDIUM: e-file  
PATENT NUMBER: US 6036689 PATENT DATE GRANTED: March 14, 2000 20000314  
PATENT COUNTRY: USA  
ISSN: 0098-1133  
DOCUMENT TYPE: Patent  
RECORD TYPE: Abstract  
LANGUAGE: English

ABSTRACT: An **ablation** device for treating atherosclerotic **tissues** of a patient, the **ablation** device comprising a catheter shaft and an inner catheter, the inner catheter having a deployable **electrode** means, wherein the deployable **electrode** means comprises a **plurality** of preshaped **expandable** metallic basket members at the distal end of the inner catheter adapted to contact the atherosclerotic **tissues** and to apply RF current to the **tissues** for therapeutic purposes. Alternately, a **plurality** of **expandable** metallic basket members are wrapped onto and around a balloon of an **ablation** device system.

MAJOR CONCEPTS: Equipment, Apparatus, Devices and Instrumentation;  
Cardiovascular Medicine (Human Medicine, Medical Sciences); Methods and Techniques

METHODS & EQUIPMENT: ablation device--surgical method; treating atherosclerotic tissues--surgical method

26/9/8 (Item 6 from file: 5)  
DIALOG(R)File 5:Biosis Previews(R)  
(c) 2002 BIOSIS. All rts. reserv.

10559346 BIOSIS NO.: 199699180491

**Percutaneous multielectrode endocardial mapping during ventricular tachycardia in the swine model.**

AUTHOR: Eldar Michael(a); Fitzpatrick Adam P; Ohad Dan; Smith Michael F;  
Hsu Steve; Whayne James G; Vered Zvi; Rotstein Zeev; Kordis Thomas;  
Swanson David K; Chin Michael; Scheinman Melvin M; Lesh Michael D;  
Greenspon Arnold J

AUTHOR ADDRESS: (a)Neufeld Cardiac Res. Inst., Sheba Med. Cent., Tel Hashomer 52621\*\*Israel

JOURNAL: Circulation 94 (5):p1125-1130 1996

ISSN: 0009-7322

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: Background: Identification of critical areas within the ventricular tachycardia circuit is a prerequisite for catheter **ablation**. Currently, mapping during ventricular tachycardia, usually performed with standard catheters, is difficult and time-consuming and can be used only in patients with hemodynamically stable tachycardia. Methods and Results: A total of 43 pigs underwent closed-chest induction of myocardial infarction. A basket-shaped catheter carrying 64 electrodes was deployed in the left ventricle during normal sinus rhythm. Unipolar pacing at 3 mA was successful in 78% of the **basket** catheter **electrodes**, demonstrating good electrode- **tissue** contact. Hemodynamic and echocardiographic measurements did not reveal any significant interference with myocardial or valvular function during or after catheter deployment. One hundred eighteen episodes of monomorphic ventricular tachycardia were induced in 28 pigs through right ventricular stimulation, 81 of which were mapped and analyzed. Ventricular tachycardia mapping was rapid, requiring only several beats and 10 seconds to complete. Presystolic potentials, a possible target for **ablation**, were identified in 58% of the tachycardia episodes mapped. Pathological examination revealed only minor valvular and endocardial catheter-induced lesions immediately after mapping and none a month later. Conclusions: The multielectrode catheter enables rapid and safe

percutaneous endocardial mapping of ventricular tachycardia in the swine model. Exploration of the clinical potential of the multielectrode catheter seems warranted.

DESCRIPTORS:

MAJOR CONCEPTS: Cardiovascular System (Transport and Circulation); General Life Studies; Methods and Techniques; Pathology; Physiology

BIOSYSTEMATIC NAMES: Bovidae--Artiodactyla, Mammalia, Vertebrata, Chordata, Animalia

ORGANISMS: sheep (Bovidae)

BIOSYSTEMATIC CLASSIFICATION (SUPER TAXA): animals; artiodactyls; chordates; mammals; nonhuman mammals; nonhuman vertebrates; vertebrates

MISCELLANEOUS TERMS: ANIMAL MODEL; CARDIOVASCULAR SYSTEM; CATHETER; DIAGNOSTIC METHOD; HEART DISEASE; METHODOLOGY; MYOCARDIAL INFARCTION; PERCUTANEOUS MULTIELECTRODE ENDOCARDIAL MAPPING; VASCULAR DISEASE; VENTRICULAR TACHYCARDIA

CONCEPT CODES:

10504 Biophysics-General Biophysical Techniques

10511 Biophysics-Bioengineering

10610 External Effects-Electric, Magnetic and Gravitational Phenomena

12504 Pathology, General and Miscellaneous-Diagnostic

14501 Cardiovascular System-General; Methods

14506 Cardiovascular System-Heart Pathology

BIOSYSTEMATIC CODES:

85715 Bovidae

26/9/9 (Item 1 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

(c) 2002 Inst for Sci Info. All rts. reserv.

10230370 Genuine Article#: 502FB Number of References: 18

**Title: Radiofrequency lesions produced by handheld temperature controlled probes for use in atrial fibrillation surgery**

Author(s): Thomas SP (REPRINT) ; Nicholson IA; Nunn GR; Ross DL

Corporate Source: Westmead Hosp, Dept Cardiol, Westmead/NSW 2145/Australia/ (REPRINT); Westmead Hosp, Dept Cardiol, Westmead/NSW 2145/Australia/;

Westmead Hosp, Dept Cardiothorac Surg, Westmead/NSW 2145/Australia/

Journal: EUROPEAN JOURNAL OF CARDIO-THORACIC SURGERY, 2001, V20, N6 (DEC), P1188-1193

ISSN: 1010-7940 Publication date: 20011200

Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

Language: English Document Type: ARTICLE

Geographic Location: Australia

Journal Subject Category: CARDIAC & CARDIOVASCULAR SYSTEMS; RESPIRATORY SYSTEM; SURGERY

**Abstract:** Objectives: Detailed analysis of the size and shape of lesions produced by handheld radiofrequency **ablation** devices at open heart surgery has not been reported previously. Methods: Radiofrequency lesions were made from the epicardial surface of the cardiac ventricles in open-chested dogs. The effects of **electrode** size, **electrode** temperature and duration of **ablation** were studied. In a second **group** of experiments simultaneous multielectrode **ablation** was performed on the ventricular epicardium after cold cardioplegia. Results: Using it single 12 x 2.5 mm, **electrode** and a target temperature of 80 degreesC the lesion depth increased from 3.8 +/- 0.9 mm at 15 s, to 6.1 +/- 0.9 mm at 120 s (P = 0.01). Increasing the target temperature from 70 to 90 degreesC (for 60 s) increased lesion depth from 5.0 +/- 1.2 to 5.6 +/- 1.7 mm (P = 0.2). There was no difference in depth of lesions with the two **electrode** widths (4.0 +/- 0.5 mm (large) vs. 3.9 +/- 1.0 mm (small)). Lesions produced using the multielectrode probe (80 degreesC, 60 s) were 30-35 mm long with even penetration into the **tissue**. The mean depth of these lesions on microscopic sections was 3.9 mm. The mean width was 7.1 mm. Conclusions: Handheld probes can be used to make deep linear lesions in the myocardium. Lesions **expand** rapidly and are wider than they are deep. A multielectrode **ablation** device allows rapid formation of linear lesions. (C) 2001 Elsevier Science B.V. All rights reserved.

Descriptors--Author Keywords: radiofrequency ; ablation ; atrial  
fibrillation

Identifiers--KeyWord Plus(R): CATHETER ABLATION; MYOCARDIUM; DELIVERY

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26/9/10 (Item 2 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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09946609 Genuine Article#: 468HV Number of References: 32

Title: An ex vivo study on radiofrequency tissue ablation : increased  
lesion size by using an "expandable -wet" electrode

Author(s): Miao Y; Ni YC (REPRINT) ; Yu J; Zhang H; Baert A; Marchal G  
Corporate Source: Katholieke Univ Leuven, Univ Hosp, Dept Radiol, Herestr  
49/B-3000 Louvain//Belgium/ (REPRINT); Katholieke Univ Leuven, Univ Hosp  
, Dept Radiol, B-3000 Louvain//Belgium/; Nanjing Med Univ, Affiliated  
Hosp 1, Dept Gen Surg, Nanjing 210029//Peoples R China/

Journal: EUROPEAN RADIOLOGY, 2001, V11, N9, P1841-1847

ISSN: 0938-7994 Publication date: 20010000

Publisher: SPRINGER-VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010 USA

Language: English Document Type: ARTICLE

Geographic Location: Belgium; Peoples R China

Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING

Abstract: The present comparative study was conducted to validate a newly  
developed "expandable -wet" electrode for an increased lesion size  
of radiofrequency ablation (RFA) on excised beef liver. The  
expandable -wet electrode, which allows interstitial hypertonic  
saline infusion through retractable curved needles, was compared with "  
expanded -dry" and "unexpended-wet" electrodes for RFA lesion size  
and other parameters. A total of 120 lesions were created under 50 W (  
groups A-C) and 90 W (groups A'-C') power control mode for 10 min at  
each ablation site with the following groups: group A and A' of  
expanded -dry electrode (needles deployed but saline uninfused);  
group B and B' of unexpended-wet electrode (saline infused but  
needle undeployed); and group C and C' of expanded -wet electrode  
(needles deployed and saline infused). Together with lower impedance  
and higher power output, the lesion size in group C (5.3 +/- 0.4 cm)  
and C' (6.0 +/- 1.0 cm) were significantly larger (P < 0.01) than that  
in group A (3.3 +/- 0.3 cm) and A' (2.0 +/- 0.2 cm), and group B  
(3.8 +/- 1.0 cm) and B' (2.6 +/- 0.4 cm). The RFA lesion size can be  
significantly enlarged when the expandable electrode is  
complemented with interstitial hypertonic saline infusion. This design  
may improve the efficacy of RF tumor ablation.

Descriptors--Author Keywords: radiofrequency ablation ; liver ;  
experiment ; electrode

Identifiers--KeyWord Plus(R): SMALL HEPATOCELLULAR-CARCINOMA; THERMAL  
ABLATION ; LIVER METASTASES; HEPATIC MALIGNANCIES; CATHETER ABLATION ;  
ETHANOL INJECTION; NEEDLE ELECTRODE ; TUMORS; ELECTROCAUTERY;  
TEMPERATURE

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26/9/11 (Item 3 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

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09271200 Genuine Article#: 386QX Number of References: 25

**Title: Radiofrequency liver ablation : Experimental comparative study of water-cooled versus expandable systems**

**Author(s):** de Baere T (REPRINT) ; Denys A; Wood BJ; Lassau N; Kardache M; Vilgrain V; Menu Y; Roche A

**Corporate Source:** Inst Gustave Roussy, Serv Radiol Intervent, Rue Camille Desmoulins/F-94805 Villejuif//France/ (REPRINT); Inst Gustave Roussy, Serv Radiol Intervent, F-94805 Villejuif//France/; Hop Beaujon, Serv Imagerie Med, F-92110 Clichy//France/; NIH, Dept Radiol, Bethesda//MD/20892

**Journal:** AMERICAN JOURNAL OF ROENTGENOLOGY, 2001, V176, N1 (JAN), P187-192

**ISSN:** 0361-803X **Publication date:** 20010100

**Publisher:** AMER ROENTGEN RAY SOC, 1891 PRESTON WHITE DR, SUBSCRIPTION FULFILLMENT, RESTON, VA 22091 USA

**Language:** English **Document Type:** ARTICLE

**Geographic Location:** France; USA

**Journal Subject Category:** RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING

**Abstract:** OBJECTIVE. We evaluate the uniformity and reproducibility of thermal lesion **ablation** and quantify the volume of **tissue** destruction and hemorrhage induced with two different commercially available radiofrequency **ablation** devices.

**MATERIALS AND METHODS.** A four- **array** anchor **expandable** needle **electrode** and a triple-cluster cooled-tip needle **electrode** were used to induce lesions in three explanted calf livers and in vivo in eight swine livers. The sizes of the radiofrequency-induced lesions were macroscopically evaluated by measuring two perpendicular dimensions immediately after the experiment. Bleeding was evaluated by weighing gauze swabs used to dry the hemorrhage caused by **electrode** insertions.



RESULTS. In explanted liver, the mean diameter of the radiofrequency-induced lesion was 5.3 +/- 0.7 cm for the cooled-tip needle and 3.7 +/- 0.4 cm for the **expandable** needle (p = 0.042), which correspond to approximate volumes of 65.35 +/- 26.22 cm(3) and 26.67 +/- 9.59 cm(3), respectively (p < 0.002). In vivo, the mean diameter was 3.7 +/- 0.4 cm for the cooled-tip needle and 3 +/- 0.4 cm for the **expandable** needle (p < 0.0001), which correspond to approximate volumes of 24.18 +/- 7.56 cm(3) and 11.16 +/- 3.65 cm(3), respectively (p < 0.0001). Blood loss attained a median value of 3.5 g for the cooled-tip needle and 2.6 g for the **expandable** needle; this difference was not statistically significant (p = 0.06).

CONCLUSION. The cooled-tip needle induced significantly larger lesions than the **expandable** needle, but the lesions produced by the **expandable** needle are more reproducible, uniform, and spheric. The larger size of the lesions produced by the cooled-tip needle may be attributed to the higher maximum power used by the generator and the higher energy deposition, which is due to the cooling of the needle **electrode**.

Identifiers--KeyWord Plus(R): SMALL HEPATOCELLULAR-CARCINOMA; **TISSUE ABLATION** ; HEPATIC METASTASES; NEEDLE **ELECTRODE** ; TUMORS; ELECTROCAUTERY; EXPERIENCE; RESECTION; INCREASE; VOLUME

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SEKI T, 1994, V74, P817, CANCER  
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26/9/12 (Item 4 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
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09252286 Genuine Article#: 384BR Number of References: 43

Title: **Radiofrequency thermal ablation of liver tumors: State-of-the-art**

Author(s): Lencioni R (REPRINT) ; Cioni D; Goletti O; Bartolozzi C

Corporate Source: Santa Chiara Univ Hosp, Div Diagnost & Intervent

Radiol, Via Roma 67/I-56125 Pisa//Italy/ (REPRINT); Univ Pisa, Div

Diagnost & Intervent Radiol, Dept Oncol Transplants & Adv Technol

Med, I-56125 Pisa//Italy/; Univ Pisa, Dept Surg, I-56125 Pisa//Italy/

Journal: CANCER JOURNAL, 2000, V6, 4 (NOV-DEC), PS304-S315

ISSN: 1528-9117 Publication date: 20001100

Publisher: JONES AND BARTLETT PUBLISHERS, 40 TALL PONE DR, SUDBURY, MA  
01776 USA

Language: English Document Type: REVIEW

Geographic Location: Italy

Journal Subject Category: ONCOLOGY

**Abstract:** Radiofrequency (RF) thermal **ablation** is a promising and rapidly evolving technique for the treatment of liver malignancies. Until few years ago, conventional RF treatment performed with a single monopolar electrode was capable of producing thermal necrosis lesions not greater than 1.6 cm in diameter. Substantial improvements in the RF technique included the development of high-power generators coupled with dual-lumen, cooled-tip **electrode** needles or **expandable electrode** needles with multiple retractable lateral-exit jackhooks on the tip. Moreover, angiographically assisted strategies for further increasing the volume of RF-induced **coagulation** necrosis were devised. Currently, thermal necrosis volumes up to 5 cm in diameter can be obtained with a single-probe insertion, enabling percutaneous **ablation** of either primary or secondary hepatic malignancies in a single session. In this article, we review the current research and clinical experience with RF **ablation** for treating malignant hepatic tumors.

**Descriptors--Author Keywords:** hepatocellular carcinoma ; liver metastasis ; nonsurgical treatment ; radiofrequency thermal **ablation**

**Identifiers--KeyWord Plus(R):** PERCUTANEOUS ETHANOL INJECTION; SMALL HEPATOCELLULAR-CARCINOMA; TRANSCATHETER ARTERIAL EMBOLIZATION; COLOR DOPPLER US; **TISSUE ABLATION** ; HEPATIC RESECTION; METASTASES; ELECTRODE; EXPERIENCE; CIRRHOSIS

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GOLDBERG SN, 1998, V209, P371, RADIOLOGY  
GOLDBERG SN, 1996, V3, P636, ACAD RADIOL  
GOLDBERG SN, 1998, V9, P101, J VASC INTERV RADIOL  
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DIALOG(R) File 34:SciSearch(R) Cited Ref Sci

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07918536 Genuine Article#: 224GU Number of References: 17

**Title: Relationship between the shape and size of radiofrequency induced thermal lesions and hepatic vascularization**

**Author(s):** Rossi S; Garbagnati F (REPRINT) ; DeFrancesco I; Accocella F; Leonardi L; Quaretti P; Zangrandi A; Paties C; Lencioni R

**Corporate Source:** IST NAZL TUMORI, DIPARTIMENTO RADIOL, VIA VENEZIAN 1/I-20133 MILAN//ITALY/ (REPRINT); PUBL HOSP PIACENZA, DEPT GASTROENTEROL/PIACENZA//ITALY//; NATL CANC INST, DEPT RADIOL/I-20133 MILAN//ITALY//; VET UNIV MILAN, DEPT RADIOL/MILAN//ITALY//; VET UNIV MILAN, DEPT SURG/MILAN//ITALY//; PUBL HOSP PIACENZA, DEPT RADIOL/PIACENZA//ITALY//; PUBL HOSP PIACENZA, DEPT HUMAN PATHOL/PIACENZA//ITALY//; HOSP SAN RAFFAELE, DEPT HUMAN PATHOL/I-20132 MILAN//ITALY//; UNIV PISA, DEPT RADIOL/PISA//ITALY/

**Journal:** TUMORI, 1999, V85, N2 (MAR-APR), P128-132

**ISSN:** 0300-8916 **Publication date:** 19990300

**Publisher:** PENSIERO SCIENTIFICO EDITOR, VIA BRADANO 3/C, 00199 ROME, ITALY

**Language:** English **Document Type:** ARTICLE

**Geographic Location:** ITALY

**Subfile:** CC LIFE--Current Contents, Life Sciences

**Journal Subject Category:** ONCOLOGY

**Abstract:** Aims and background: The aim of this study was to evaluate the relationship between hepatic vascularisation and the final size and shape of radiofrequency (RF) induced thermal lesions.

**Methods:** Series of four RF thermal lesions were created in explanted calf livers and in pig livers maintaining the following experimental conditions throughout the procedure: normal hepatic perfusion, occlusion of the hepatic artery, occlusion of the portal vein, occlusion of both hepatic artery and portal vein (Pringle maneuver) and subtotal occlusion of the hepatic veins. A 14G **expandable** needle **electrode** was used to make the thermal lesions. Each lesion was created applying predetermined temperatures ranging between 95 and 115 degrees C and an exposure time of 20 minutes.

**Results:** Occlusion of the hepatic artery during the RF procedure resulted in moderate and not significant increases in thermal lesion diameter compared with those obtained in normally perfused liver (3.0 +/- 0.4 cm vs 3.0 +/- 0.2 cm), while occlusion of the portal vein resulted in larger lesion diameters (3.5 +/- 0.3 cm). In both these cases the diameters of the thermal lesions were smaller than those obtained in explanted calf liver (4.0 +/- 0.3 cm) and their shape showed peripheral irregularities. Thermal lesions larger than those seen in normally perfused liver and equaling those observed in explanted calf liver were created both during the Pringle maneuver (4.0 +/- 0.2 cm) and after subtotal occlusion of the hepatic veins (4.0 +/- 0.3 cm). In both these cases the thermal lesions were regular in shape.

**Conclusions:** Occlusion of the blood flow during the RF procedure avoids heat loss by convection, resulting in the creation of larger thermal lesions than those obtained in normally vascularized liver using the same electrode, temperatures and exposure time. This technique could therefore be employed in humans to destroy large hepatic tumor nodules.

**Descriptors--Author Keywords:** radiofrequency interstitial thermal **ablation** ; liver tumors ; hepatocellular carcinoma

**Identifiers--KeyWord Plus(R):** NEEDLE ELECTRODE; **TISSUE ABLATION** ; METASTASES; LIVER

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26/9/14 (Item 6 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
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07681221 Genuine Article#: 195ZA Number of References: 24

**Title: Percutaneous radiofrequency thermal ablation combined with transcatheter arterial embolization in the treatment of large hepatocellular carcinoma**

Author(s): Buscarini L (REPRINT) ; Buscarini E; DiStasi M; Quaretti P; Zangrandi A

Corporate Source: GEN HOSP, DEPT GASTROENTEROL, VIA TAVERNA 49/I-29100 PIACENZO//ITALY/ (REPRINT); HOSP PIACENZA, DEPT GASTROENTEROL/PIACENZO//ITALY/; HOSP PIACENZA, DEPT RADIOL/PIACENZO//ITALY/; HOSP PIACENZA, DEPT PATHOL/PIACENZO//ITALY/

Journal: ULTRASCHALL IN DER MEDIZIN, 1999, V20, N2 (APR), P47-53

ISSN: 0172-4614 Publication date: 19990400

Publisher: GEORG THIEME VERLAG, P O BOX 30 11 20, D-70451 STUTTGART, GERMANY

Language: English Document Type: EDITORIAL MATERIAL

Geographic Location: ITALY

Subfile: CC CLIN--Current Contents, Clinical Medicine

Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING; ACOUSTICS

**Abstract:** Purpose: To evaluate whether the combination of hepatic segmental transcatheter arterial embolization (TAE) with percutaneous radiofrequency (RF) **ablation** can increase the volume of **coagulation** necrosis to treat patients with large hepatocellular carcinoma (HCC). Method: Fourteen patients with cirrhosis and HCC whose greatest diameter ranged from 3.8 to 6.8 cm (mean, 5.2 cm) underwent segmental TAE followed within 3 days by RF interstitial thermal **ablation** with an **expandable** needle **electrode** inserted into the tumour under sonographic guidance, after local anesthesia. We made one or more needle electrode insertions depending on tumor shape. Posttreatment necrosis was evaluated by ultrasonography, dynamic computed tomography (CT) and cc-fetoprotein dosage in all cases, repeated every three to four months. Results: Tumor **ablation** was obtained in one session in 11 (78%) patients (with one needle electrode insertion in 8 patients), in two sessions in 1, in three sessions in 2. In a mean follow-up of 13.2 months (range 6-23) two patients died from unrelated causes; one patient showed multinodular HCC 6 months after the treatment; 4 patients developed new lesions, treated by a new course of RF **ablation** (3 cases) or by surgery (1 case); therefore 11/12 patients still in follow-up were disease-free. No fatal complications were observed. One month after the treatment, fluid collection at the site of the **ablated** tumor was observed in one patient which was percutaneously drained. Conclusions: Percutaneous RF thermal **ablation** performed after TAE effectively treated HCCs larger than tumors suitable for segmental TAE or RF application alone; the result was achieved in two thirds of the cases in a single session with only one needle electrode insertion.

**Descriptors--Author Keywords:** ultrasonography ; liver neoplasms ; therapy ; radiofrequency (RF) **ablation** ; therapeutic blockade ; arterial catheter embolisation

**Identifiers--KeyWord Plus(R):** ETHANOL INJECTION; **TISSUE ABLATION** ; NEEDLE ELECTRODE; LIVER-TUMORS; METASTASES; CIRRHOSIS; FLOW

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06583019 Genuine Article#: ZC706 Number of References: 27

**Title: Percutaneous treatment of small hepatic tumors by an expandable RF needle electrode**

Author(s): Rossi S (REPRINT) ; Buscarini E; Garbagnati F; DiStasi M;

Quaretti P; Rago M; Zangrandi A; Andreola S; Silverman D; Buscarini L

Corporate Source: HOSP PIACENZA,DEPT GASTROENTEROL, VIA TAVERNA 49/I-29100

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PIACENZA,DEPT HUMAN PATHOL/I-29100 PIACENZO//ITALY//; NATL CANC

INST,DEPT HUMAN PATHOL/I-20133 MILAN//ITALY//; RADIOFREQUENCY

INTERSTITIAL THERMAL ABLAT MED SYS,/PALO ALTO//CA/94306

Journal: AMERICAN JOURNAL OF ROENTGENOLOGY, 1998, V170, N4 (APR), P  
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Contents, Clinical Medicine

Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING

**Abstract: OBJECTIVE,** The aim of this study was to evaluate the usefulness  
 of **expandable RF needle electrodes** in the treatment of hepatic  
 cancer.

**SUBJECTS AND METHODS,** Thirty-seven patients, 23 of whom had 26  
 hepatocellular carcinoma nodules and 14 of whom had 19 hepatic  
 metastatic nodules, underwent treatment by RF interstitial thermal  
**ablation with expandable needle electrodes**. Forty-five tumor  
 nodules were treated in 64 RF interstitial thermal **ablation** sessions  
 with 83 needle electrode insertions. The mean diameter of the tumor  
 nodules was 2.5 cm (range, 1.1-3.5 cm). Immediate posttreatment tumor  
 necrosis was evaluated by dynamic CT in all cases. Two patients with  
 hepatocellular carcinoma and three patients with metastases underwent  
 surgical resection 20-60 days after RF treatment. The remaining 32  
 patients were followed up clinically.

**RESULTS.** The mean number of RF interstitial thermal **ablation**

sessions to complete tumor nodule treatment was 1.4, Mean number of needle electrode insertions was 1.8. No complications were observed. Posttreatment dynamic CT showed a completely nonenhancing area in the site of the treated tumor in 44 of 45 cases. The remaining patient with metastatic disease had persistent enhancing **tissue**. Histology showed complete necrosis in four treated tumor nodules and residual viable cancer in one. Twenty-one patients with hepatocellular carcinoma were followed up for 6-19 months (mean, 10 months). Of these patients, six showed recurrences and 15 remained apparently disease-free. Two patients died, one from advanced cancer and one from other causes. Eleven patients with hepatic metastases were followed up for 7-20 months (mean, 12 months). Of these patients, nine showed recurrent disease and only two remained apparently disease-free. Two patients died from disseminated disease,

**CONCLUSION.** RF interstitial thermal **ablation** of hepatic tumor by **expandable** needle **electrodes** is a safe and effective technique. Local **ablation** of tumors not exceeding 3.5 cm in diameter is achieved in a short time without complications.

Identifiers--Keyword Plus(R): SMALL HEPATOCELLULAR-CARCINOMA; ETHANOL INJECTION; MICROWAVE COAGULATION ; LIVER; **ABLATION**; LASER; METASTASES; THERAPY; CANCER; **TISSUE**

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26/9/16 (Item 8 from file: 34)

DIALOG(R)File 34:SciSearch(R) Cited Ref Sci  
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01792733 Genuine Article#: JB103 Number of References: 31  
**Title: TRANSCATHETER ABLATION OF CARDIAC TISSUE - ADVANTAGES AND DISADVANTAGES OF DIFFERENT ABLATIVE TECHNIQUES**  
Author(s): SHENASA M; WILLEMS S; CHEN X; FROMER M; BORGGREFE M  
Corporate Source: MED KLIN & POLIKLIN, ALBERT SCHWEITZER ST 33/W-4400 MUNSTER//GERMANY//; CHU VAUDOIS, DIV CARDIOL/CH-1011 LAUSANNE//SWITZERLAND//; UNIV MUNSTER HOSP, DEPT CARDIOL & ANGIOL/MUNSTER//GERMANY/  
Journal: HERZ, 1992, V17, N3 (JUN), P137-142  
Language: ENGLISH Document Type: ARTICLE  
Geographic Location: SWITZERLAND; GERMANY  
Subfile: SciSearch; CC CLIN--Current Contents, Clinical Medicine

.. ABSTRACT: Transcatheter ablation techniques are emerging as an alternative therapeutical tool in the management of cardiac arrhythmias. Catheter ablation was initially introduced as the last resort to ablate the atrioventricular nodal conduction in patients with atrial fibrillation and uncontrolled ventricular response and in patients with drug refractory ventricular tachycardias. Direct current energy was used as the sole source of energy, but because of potential significant complications and early and late mortality, presumably mostly due to ventricular tachyarrhythmias, other sources of energy were sought. Radiofrequency current which does not produce barotrauma and does not require general anesthesia rapidly replaced direct current ablation in many centers. Early results with radiofrequency current ablation of the atrioventricular node and accessory atrioventricular pathways are very encouraging. The results of radiofrequency as well as direct current ablation for atrial flutter, atrial tachycardia and ventricular tachycardia, where the components of reentry circuit are less defined, are not as favorable as those of AV junctional tachycardias. However, improvement of catheter and generatory technology and better understanding of the mechanisms of ventricular tachycardias and characteristics of the target site will enhance the results of catheter ablation in ventricular tachycardias. The procedures are still considered investigational, and mostly done by very experienced groups at tertiary referral hospitals with surgical teams available in case of serious complications. Larger patient populations and longer follow-up periods are required before these techniques expand to community hospitals and to patients with minimal symptoms or asymptomatic individuals as a prophylaxis therapy.

Identifiers--KeyWords Plus: TRANSCORONARY CHEMICAL ABLATION; CLOSED-CHEST ABLATION; VENTRICULAR-TACHYCARDIA; ATRIOVENTRICULAR-CONDUCTION; LASER PHOTOABLATION; ELECTRICAL ABLATION; CATHETER ABLATION; ARRHYTHMIAS; **ELECTRODE**; ENERGY

Research Fronts: 90-1816 003 (ATRIOVENTRICULAR NODE FOR AV NODE REENTRANT TACHYCARDIA; CATHETER ABLATION TECHNIQUES; MULTIPLE ACCESSORY PATHWAYS; SUPRAVENTRICULAR ARRHYTHMIAS)

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26/9/17 (Item 1 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

13101492 21886255 PMID: 11888817

**Intracardiac echocardiography.**

Bruce C J; Friedman P A

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Eur J Echocardiogr (England) Dec 2001, 2 (4) p234-44, ISSN 1525-2167 Journal Code: 100890618

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This article describes currently available intracardiac ultrasound (ICE) technology contrasting it with intravascular ultrasound (IVUS), highlighting their differences. General and specific clinical applications, limitations and future developments of ICE are addressed. ICE is possible because lower frequency transducers (in contrast to higher frequency IVUS devices) have been miniaturized and mounted onto catheters capable of percutaneous insertion into the heart. Since the recent availability of a steerable, 5.5--10MHz phased- **array** catheter with full Doppler capability, these lower frequency transducers are not only capable of enhanced penetration, permitting high-resolution two-dimensional (2D) imaging but can also provide haemodynamic data. ICE facilitates electrophysiologic procedures by guiding trans-septal catheterization, enabling endocardial anatomy visualization, ensuring **ablation electrode / tissue** contact and promptly diagnosing procedural complications. Promising non-electrophysiologic applications include guidance of percutaneous closure of septal defects, percutaneous mitral balloon valvuloplasty and complex cardiac biopsy. Current limitations include monoplanar imaging and narrow field of view. **Expanded** diagnostic techniques such as **tissue** Doppler, multiplane, three dimensional (3D) and multimodality imaging represent future refinements. ICE is now a clinical tool. With the introduction of the newest phased- **array** transducer, with full Doppler capability, ICE has the potential to play an important role in diagnostic and therapeutic interventional procedures. Further refinement and miniaturization hold the key to primary operator controlled, integrated ultrasound-guided interventional devices. (41 Refs.)

Tags: Human

Descriptors: \*Echocardiography, Doppler--trends--TD; \*Ultrasonography, Interventional--instrumentation--IS; Arrhythmia--ultrasonography--US; Electrophysiology--methods--MT; Heart Catheterization--instrumentation--IS

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DIALOG(R) File 73:EMBASE

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11306428 EMBASE No: 2001319639

**Linear lesion radiofrequency ablation in canine vagal atrial fibrillation: Effects of special catheters designed for efficiency, and the critical role of lesions from the crista terminalis to the superior vena cava**

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Journal of Interventional Cardiac Electrophysiology ( J. INTERVENT. CARD.

ELECTROPHYSIOL. ) (Netherlands) 2001, 5/3 (241-252)

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DOCUMENT TYPE: Journal ; Article

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NUMBER OF REFERENCES: 16



Objective: To determine whether specially devised catheters could be used to place radiofrequency (RF) linear lesions quickly and efficiently for termination and/or prevention of atrial fibrillation (AF). Methods: Two versions of 2 different types of **ablating** catheters were used in 12 canines with AF induced by rapid pacing during vagal stimulation. 1) Modified basket catheters in two versions, one designed to produce caudo-cranial linear lesions through extended bare electrode-splines in contact with the atrial wall; and the other designed to produce horizontal linear lesions by revolving within the atrium. Together these would form "longitude and latitude" grids in the atrium. 2) The second catheter type was 2 versions of coil electrodes with thermocouples centered under each of the large-area coil electrodes. One version of these deflectable coil electrodes was intended to produce lesions in the tricuspid valve annulus-inferior vena cava (IVC) isthmus; and along the crista terminalis from the superior vena cava (SVC) to the IVC. A different type of deflection angulation on the second version was intended to produce more horizontal lesions from the crista to the tricuspid annulus. Guidance was fluoroscopic, and by electrograms and transesophageal echo. Gross pathologic examinations followed each experiment. Prior to use in canines, all electrode configurations were tested in vitro on fresh bovine preparations suspended in saline at 37degreesC. Results: The bare spline and coil electrode catheter configurations produced discrete non-perforating non-charring lesions in the in vitro preparations. One dog died of exsanguinating hemorrhage. Post mortem examination revealed the lesions to be extremely variable, ranging from no evidence of effective RF delivery to deep lesions with perforation. Seven clinical successes were achieved (6 complete), with the coil electrode catheters accounting for 5 of the 7, although the procedure times were shorter with the baskets. Critical lesions were those from the crista to the SVC. Planned trans-isthmus lesions were not done, but may be needed to prevent atrial flutter not seen prior to effective AF **ablation**. Conclusions: Special **basket** and coil- **electrode** catheters may be useful but require refinement. The finding that lesions between the crista terminalis and the SVC were critical to success may be applicable to some cases of AF in humans.

DEVICE BRAND NAME/MANUFACTURER NAME: Amazr; Sidewindr

MEDICAL DESCRIPTORS:

\*catheter **ablation** ; \*heart atrium fibrillation--prevention--pc; \*heart atrium fibrillation--therapy--th; \*vagus nerve stimulation treatment outcome; superior cava vein; heart atrium pacing; electrode; bleeding--complication--co; cause of death; autopsy; fluoroscopy; perforation--complication--co; dog; inferior cava vein; nonhuman; female; animal experiment; animal model; controlled study; animal **tissue** ; article ; priority journal

SECTION HEADINGS:

006 Internal Medicine  
014 Radiology  
018 Cardiovascular Diseases and Cardiovascular Surgery  
027 Biophysics, Bioengineering and Medical Instrumentation

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DIALOG(R)File 73:EMBASE

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**Global distribution of atrial ectopic foci triggering recurrence of atrial tachyarrhythmia after electrical cardioversion of long-standing atrial fibrillation: A bi-atrial basket mapping study**

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**OBJECTIVES:** The objective of this study was to assess the spatial distribution of atrial ectopic foci potentially triggering recurrent atrial tachyarrhythmias after electrical cardioversion of long-standing atrial fibrillation (AF). **BACKGROUND:** It remains unknown whether targeted **ablation** of atrial ectopic foci concentrated in the pulmonary veins is feasible in patients with long-standing AF as it is in patients with paroxysmal AF. **METHODS:** Two **basket electrodes** (32 bipoles on each eight splines) were positioned in the right and left atrium to identify the earliest endocardial activation sites of atrial ectopic foci emerging immediately after external electrical cardioversion of long-standing AF, before and after intravenous administration of dl-sotalol (16 patients) and propafenone (16 patients). **RESULTS:** Before the use of antiarrhythmics, 91 distinct atrial ectopic foci were recognized after cardioversion. In 69 of the 91 foci, the earliest sites of presystolic atrial activation could be identified. Left atrial posterior (16 foci), left atrial anterior (11 foci) and right atrial posterior regions (13 foci) appeared to be prevalent. However, atrial ectopies from the remaining atrial regions (29 foci) were not uncommon. After adding dl-sotalol or propafenone, only 64 atrial ectopic foci were recognized after cardioversion; 50 of those were identifiable at the earliest activation sites. The scattered pattern of spatial distribution of the atrial ectopic foci was virtually unchanged. **CONCLUSIONS:** Atrial ectopic foci potentially triggering the recurrence of atrial tachyarrhythmias after successful electrical cardioversion of long-standing AF were scattered in spatial distribution and multiple in production, possibly rendering difficult the targeted **ablation** approach. (c) 2001 by the American College of Cardiology.

**DRUG DESCRIPTORS:**

sotalol--clinical trial--ct; sotalol--drug therapy--dt; sotalol  
--intravenous drug administration--iv; propafenone--clinical trial--ct;  
propafenone--drug therapy--dt; propafenone--intravenous drug administration  
--iv

**MEDICAL DESCRIPTORS:**

\*heart atrium arrhythmia--etiology--et; \*cardioversion; \*heart atrium  
fibrillation--drug therapy--dt; \*heart atrium fibrillation--therapy--th  
recurrent disease; pulmonary vein; heart right atrium; heart left atrium;  
**tissue** distribution; heart electrophysiology; human; male; female;  
clinical article; clinical trial; randomized controlled trial; controlled  
study; aged; adult; article; priority journal  
CAS REGISTRY NO.: 3930-20-9, 80456-07-1, 959-24-0 (sotalol); 34183-22-7,  
54063-53-5 (propafenone)

**SECTION HEADINGS:**

006 Internal Medicine  
018 Cardiovascular Diseases and Cardiovascular Surgery  
037 Drug Literature Index

26/9/20 (Item 3 from file: 73)

DIALOG(R)File 73:EMBASE

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10916888 EMBASE No: 2000416113

**Acute electrophysiologic effects and antifibrillatory actions of the long linear lesions in the right atrium in a sheep model**

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NUMBER OF REFERENCES: 32

Linear lesions (LL) represent an option for curing of atrial fibrillation (AF) with **ablation** techniques. Methods and Results: In 11 sheep (w. 72+/-16kg), LL were created with radiofrequency **ablation** in the lateral, posterior and septal walls of the right atrium (RA). AF was induced before and after LL with burst pacing. Mapping of the AF was performed with a 64-**electrode basket** catheter deployed in the RA. Quantitative analysis was performed with a custom-made software program. LL were confirmed histologically 7 to 10 days after the procedure. LL were transmural in 78% of their length. Stimulation thresholds and right atrial activation times were increased after LL compared to preablation values. Effective refractory periods of the RA were prolonged significantly in 7 out of 12 regions after generation of LL. Conduction velocities in the RA segments between LL were reduced in lateral, posterior and septal walls. During paced rhythms double potentials were recorded in all animals. AF could be induced in all animals of this model despite the presence of LL in the RA. AF episodes were significantly more regular after LL throughout the RA due to a significant reduction of the number of the wave fronts in the RA. During AF episodes, in the presence of LL, the RA was driven by wave fronts of left atrial origin entering the right side of the septum through interatrial connections. Conclusions: 1) LL profoundly affect electrophysiologic parameters of RA. 2) In the presence of LL, AF manifest a higher degree of regularity as compared to preablation episodes. 3) Dissociation between wave fronts of left atrial origin entering the RA through the interatrial connections is an important mechanism of the antifibrillatory action of the septal LL.

DEVICE BRAND NAME/MANUFACTURER NAME: Constellation **electrode basket** catheter/EP Technologies/United States

DEVICE MANUFACTURER NAMES: EP Technologies/United States

MEDICAL DESCRIPTORS:

\*heart atrium fibrillation--surgery--su; \*heart right atrium; \*catheter **ablation**

heart atrium septum; heart atrium conduction; heart muscle refractory period; heart electrophysiology; heart injury; heart left atrium; heart catheter; nonhuman; female; animal experiment; animal **tissue** ; article; priority journal

SECTION HEADINGS:

018 Cardiovascular Diseases and Cardiovascular Surgery

027 Biophysics, Bioengineering and Medical Instrumentation

26/9/21 (Item 1 from file: 35)

DIALOG(R)File 35:Dissertation Abs Online

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**Finite element modeling of radio-frequency cardiac and hepatic ablation**

Author: Tungjitkusolmun, Supan

Degree: Ph.D.

Year: 2000

Corporate Source/Institution: The University of Wisconsin - Madison (0262)

Supervisor: John G. Webster

Source: VOLUME 61/08-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 4325. 204 PAGES

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Descriptor Codes: 0544; 0541; 0574

ISBN: 0-599-90094-6

**Ablation** is the heating of cardiac **tissue** to cure rhythm disturbances and of liver **tissue** to cure cancer. This work presents methods, numerical results, experimental results, and applications of finite element (FE) analysis for the study of radio-frequency (RF) cardiac and hepatic **ablation**. I outline a process for FE modeling implementations of temperature-controlled (TCRFA) and power-controlled RF **ablation** (PCRFA) and investigate the effects of changes in myocardial properties to

the numeric results. The changes in myocardial properties affect the results of PCRFA more than that of TCRFA.

In this work I present FE analyses of the following **ablation** catheter designs. (1) A catheter that includes one or more needle electrodes with a diameter of 0.5 to 1.0 mm and length of 2.0 to 10 mm. The needle electrodes are capable of creating large lesions for curing ventricular tachycardia. (2) Conventional tip electrode with added curvatures and a resistive coating at the electrode-catheter interface to minimize the edge effect. I utilize FE analysis to demonstrate that there are hot spots at the edges of the conventional metal electrode and the insulating catheter. (3) Cylindrical-shaped long electrode with recessed edges, and a resistive material coating. (4) A 3-segment multielectrode catheter (MEC) **ablation** system. The last two catheter designs have potentials to create long thin lesions for the cure of atrial fibrillation.

In this work I introduce the bipolar phase-shifted technique for RF energy delivery of MEC **ablation**. I determined the optimal phase-shift between the two sinusoidal voltage sources of a two-dimensional FE model. At the optimal phase-shift, the difference between temperatures at electrode edges is minimized.

In Chapter VI, I applied the FE method to study the effect of **ablation** sites and treatment time on the dimensions of the lesion in both TCRFA and PCRFA using the conventional **electrode** design. Finally, I **expand** the application of FE analysis to develop a better understanding of the heating characteristics of the hepatic **ablation** probe. Our numeric data reveal that the shapes of the lesions created by the four-tine RF probe were mushroom-like, and were limited by the blood vessels.

Set	Items	Description
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		AT?
S2	880059	ELECTROD?
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S4	6910947	ARRAY? OR GROUP? OR PLURALITY?
S5	248470	MOISTUR?
S6	3891190	TISSUE?
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S10	9151	S1 AND S2
S11	3	S5 AND S10
S12	3	RD (unique items)
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S4	1	AU='RAMIREZ ALFONSO NMN'
S5	16	AU='HILARIO'
S6	10	S1:S4
S7	2	S1 AND S2:S4
S8	0	S2 AND S3:S4
S9	0	S3 AND S4
S10	14390	ABLAT? OR ELECTROCOAGULAT? OR ELECTRO()COAGULAT? OR COAGUL- AT?
S11	36559	MOISTURE?
S12	36803	TISSUE?
S13	77083	ELECTROD?
S14	6	S10(S)S11(S)S13
S15	6	S14 NOT S7
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S5	1	AU='HILARIO E H'
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S7	2	S1 AND S2:S5
S8	0	S2 AND S3:S5
S9	0	S3 AND S4:S5
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S11	47702	(ABLAT? OR ELECTROCOAGULAT? OR ELECTRO()COAGULAT? OR COAGU-LAT?)
S12	166545	MOISTURE?
S13	87365	TISSUE?
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